

CLAIMS:

1. A rotary type transfer apparatus for spout-equipped bags in which said spout-equipped bags are received from a plurality of first spout holding members which are disposed on a circumference of a working rotor that rotates continuously at a constant speed, and said spout-equipped bags are rotationally conveyed and transferred to a rail type conveying apparatus installed on a downstream side of said rotary type transfer apparatus, said rotary type transfer apparatus further comprising:

a transfer rotor which has a plurality of second spout holding members disposed on a circumference thereof, and

a driving means which causes said transfer rotor to rotate intermittently at predetermined angle at a time in a predetermined cycle of stopping, acceleration, constant speed, deceleration and stopping, said driving means causing a speed of said second spout holding members during said constant-speed rotation to coincide with a speed of said first spout holding members and causes said first and second spout holding members to run side by side,

wherein said second spout holding members receive said spout-equipped bags from said first spout holding members during said constant-speed rotation, and said spout-equipped bags are transferred from said second spout holding members to said rail type conveying apparatus provided on a downstream side at a predetermined stopping position of said second spout holding members.

2. The rotary type transfer apparatus for spout-equipped bags according to Claim 1, wherein:

a movement path of centers of spout holding positions of said second spout holding members and a movement path of centers of spout holding positions of said first spout holding members approach each other,

said transfer rotor rotates at a constant speed while said second spout holding members pass near a position of maximum proximity of said two movement paths, and

both of said first and second spout holding members are provided with holding grooves and tapered surfaces, said holding grooves being oriented radially outward and holding said spouts at grooves located between flanges formed on said spouts and said tapered

surfaces opening outward and being formed near entrance areas of said holding grooves; and
wherein

spouts of said bags which are held in said holding grooves of said first spout holding members are conveyed into said holding grooves of said second spout holding members while said transfer rotor rotates at a constant speed.

3. The rotary type transfer apparatus for spout-equipped bags according to Claim 2, further comprising a push-out device which, above said holding grooves, pushes said spouts out of said holding grooves of said second spout holding members that are stopped at said stopping position by means of a pusher which advances and retracts in a radial direction of said transfer rotor, thus feeding said spouts out toward said rail type conveying apparatus.

4. The rotary type transfer apparatus according to Claim 3, wherein said push-out device is provided with a safety mechanism which automatically stops a movement of said pusher toward outside in a radial direction of said transfer rotor when a resistance that exceeds a predetermined value is applied to said pusher during said movement of said pusher toward said outside.

5. The rotary type transfer apparatus for spout-equipped bags according to Claim 2, wherein

a guide member which conveys said spout-equipped bags from said first spout holding members to said second spout holding members is disposed between said working rotor and said transfer rotor, and

said guide member is provided with a guide groove that is formed continuously from said movement path of said centers of the spout holding positions of said first spout holding members to said movement path of said centers of said spout holding positions of said second spout holding members; and wherein

head portions of said spouts are inserted into said guide groove and guided along said guide groove.

6. The rotary type transfer apparatus for spout-equipped bags according to Claim 5, further comprising a push-out device which, above said holding grooves, pushes said spouts out of said holding grooves of said second spout holding members that are stopped at said

stopping position by means of a pusher which advances and retracts in a radial direction of said transfer rotor, thus feeding said spouts out toward said rail type conveying apparatus.

7. The rotary type transfer apparatus according to Claim 6, wherein said push-out device is provided with a safety mechanism which automatically stops a movement of said pusher toward outside in a radial direction of said transfer rotor when a resistance that exceeds a predetermined value is applied to said pusher during said movement of said pusher toward said outside.

8. A conveying apparatus for spout-equipped bags comprising said rotary type transfer apparatus according to any one of Claims 2 through 7 and a rail type conveying apparatus which is disposed on a downstream side of said rotary type transfer apparatus, wherein

said rail type conveying apparatus is comprised of a transfer rail device that is disposed on a furthest upstream side of said rail type conveying apparatus as a part of said rail type conveying apparatus, and said transfer rail device comprises:

transfer rails which are installed so as to be oriented radially outward from a predetermined stopping position of said second spout holding members and are used to receive spouts of spout-equipped bags from said holding grooves of said spout holding members stopped at said stopping position and transfer said spouts to a following rail type conveying apparatus, and

a driving means which moves said transfer rails from a position where said transfer rails are installed to a retracted position in which said rails receive no spouts.

9. The conveying apparatus for spout-equipped bags according to Claim 8, wherein

a plurality of grooves are formed in side surfaces of said spouts so as to be at vertically different levels,

said spout holding members of said transfer rotor and spout guides provided on said transfer rails are disposed at different heights; and wherein

grooves of said spouts that are held in said holding grooves of said spout holding members and grooves of said spouts into which said spout guides of said transfer rails are inserted are positioned at different heights in an vertical direction of said spouts.

10. The conveying apparatus for spout-equipped bags according to Claim 9, wherein:

among pair of spout guides of said transfer rails, a spout guide that is positioned on a front side with respect to a direction of rotation of said transfer rotor extends to a position that overlaps with a movement path of centers of spout holding positions of said spout holding members of said transfer rotor, and

said transfer rails are arranged so as to swing within a horizontal plane; and
wherein

when spouts that are held by said spout holding members and moved are brought into contact with a spout guide that is positioned on a front side with respect to a direction of rotation of said transfer rotor, said transfer rails swing horizontally and escape from said movement path.

when spouts that are held by said spout holding members and moved are brought into contact with said transfer rails, said transfer rails swing horizontally and escape from said movement path.

11. A conveying apparatus for spout-equipped bags comprising a rotary type transfer apparatus and a rail type conveying apparatus wherein

said rotary type transfer apparatus comprises:

a transfer rotor having a plurality of spout holding members disposed on a circumference thereof, said spout holding members being formed with holding grooves that are oriented radially outward and hold said spouts at grooves located between flanges formed on said spouts,

a driving means which causes said transfer rotor to rotate intermittently a predetermined angle at a time, and

a push-out device which, above said holding grooves, pushes said spouts out of said holding grooves of said spout holding members that are stopped at a predetermined stopping position by means of a pusher which advances and retracts in a radial direction of said transfer rotor; and

said rail type conveying apparatus is disposed on a downstream side of said rotary type transfer apparatus and is comprised of a transfer rail device that is disposed on a furthest upstream side of said rail type conveying apparatus as a part of said rail type conveying apparatus, said transfer rail device comprising:

transfer rails which are installed so as to be oriented radially outward from said stopping position and are used to receive spouts of spout-equipped bags from said holding grooves of said spout holding members stopped at said stopping position and transfer said spouts to a following rail type conveying apparatus, and

a driving means which moves said transfer rails from a position where said transfer rails are installed to a retracted position in which said rails receive no spouts.

12. The conveying apparatus for spout-equipped bags according to Claim 11, wherein

a plurality of grooves are formed in side surfaces of said spouts so as to be at vertically different levels,

said spout holding members of said transfer rotor and spout guides provided on said transfer rails are disposed at different heights; and wherein

grooves of said spouts that are held in said holding grooves of said spout holding members and grooves of said spouts into which said spout guides of said transfer rails are inserted are positioned at different heights in a vertical direction of said spouts.

13. The conveying apparatus for spout-equipped bags according to Claim 12, wherein:

among pair of spout guides of said transfer rails, a spout guide that is positioned on a front side with respect to a direction of rotation of said transfer rotor extends to a position that overlaps with a movement path of centers of spout holding positions of said spout holding members of said transfer rotor, and

said transfer rails are arranged so as to swing within a horizontal plane; and wherein

when spouts that are held by said spout holding members and moved are brought into contact with a spout guide that is positioned on a front side with respect to a direction of rotation of said transfer rotor, said transfer rails swing horizontally and escape from said movement path.

when spouts that are held by said spout holding members and moved are brought into contact with said transfer rails, said transfer rails swing horizontally and escape from said movement path.

14. The conveying apparatus for spout-equipped bags according to Claim 11, wherein said push-out device is provided with a safety mechanism which automatically stops a movement of said pusher toward outside in a radial direction of said transfer rotor when a resistance that exceeds a predetermined value is applied to said pusher during said movement of said pusher toward said outside.

15. The conveying apparatus for spout-equipped bags according to Claim 14, wherein a plurality of grooves are formed in side surfaces of said spouts so as to be at vertically different levels,

said spout holding members of said transfer rotor and spout guides provided on said transfer rails are disposed at different heights; and wherein

grooves of said spouts that are held in said holding grooves of said spout holding members and grooves of said spouts into which said spout guides of said transfer rails are inserted are positioned at different heights in an vertical direction of said spouts.

16. The conveying apparatus for spout-equipped bags according to Claim 15, wherein:

among pair of spout guides of said transfer rails, a spout guide that is positioned on a front side with respect to a direction of rotation of said transfer rotor extends to a position that overlaps with a movement path of centers of spout holding positions of said spout holding members of said transfer rotor, and

said transfer rails are arranged so as to swing within a horizontal plane; and wherein

when spouts that are held by said spout holding members and moved are brought into contact with a spout guide that is positioned on a front side with respect to a direction of rotation of said transfer rotor, said transfer rails swing horizontally and escape from said movement path.